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PSYCHE.

NOTES ON SOME EUROPEAN HYMENOPTEROUS PARASITES OF THE HESSIAN-FLY, *CECIDOMYIA DESTRUCTOR* SAY, AND OTHER INSECTS; BRED BY DR. PAUL MARCHAL, THE FRENCH GOVERNMENT ENTOMOLOGIST.

BY WILLIAM H. ASHMEAD.

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(Paper No. 1.)

In 1895 and during the year 1896 I received several sendings of most interesting Hymenopterous parasites, for determination, from Dr. Paul Marchal, the well-known French Government entomologist, of the Paris Entomological Station.

All or nearly all of these parasites were bred material and are of great biologic interest, since a few are apparently new to science, and the hosts of many others will now for the first time be made known.

It is important, therefore, on account of the economic importance of many of the species, that the new species be described and that all should be put on record, for the benefit of those interested in these insects.

Below I have therefore given descriptions of the new species, and as briefly as possible, the hosts and relationship of the different parasites.

In recording these rearings by Dr. Marchal, I shall begin with the European parasites bred from the Hessian-

fly, *Cecidomyia destructor* Say, and the Wheat-fly, *Cecidomyia avenae* Marchal, since these are of the greatest economic importance.

Host 1. **Cecidomyia destructor** Say.

- (1) *Boeotomus (Micromelus) rufomaculatus* Walk. ♀.
- (2) *Merisus destructor* Say ♂ ♀.
- (3) *Boeotomus coxalis* n. sp.

Winged form. ♀ Length 2 mm. Bronzed green, brighter on mesonotum, the head, thorax beneath and metathorax purplish or blue-green, somewhat coarsely squameously punctate; palpi white; scape of antennae except apically and legs, except coxae, brownish-yellow, knees, tips of tibiae and tarsi, except last joint, and tegulae yellowish-white; flagellum brown, subclavate, pubescent. Head transverse, wider than the thorax, about $3\frac{1}{2}$ times as wide as thick antero-posteriorly; eyes rather large oval. Antennae 13-jointed with 2 minute ring-joints, inserted slightly below the middle of the face, but above an imaginary line drawn from base of eyes; pedicel obconical; funicle 6-jointed, the joints very slightly shortening but also gradually widening to club, the first

a little longer than thick, the second and third subequal, about as long as thick, the following wider than long; club ovate 3-jointed.

Thorax with the pronotum transversely narrowed, the mesonotum a little more than twice as wide as long, with the parapsidal furrows indicated only anteriorly by two short convergent impressed lines which become obsolete at about the middle of the mesonotum; scutellum convex, with the axillae about as wide from each other as their width at base; metathorax produced into a subglobose neck, with curved lateral folds but without a median carina or spiracular furrows, the spiracles small, rounded. Wings hyaline, the nervures pale yellowish, the marginal and postmarginal veins subequal, one-third longer than the stigmal. Abdomen ovate, scarcely as long as the thorax, the second segment (first body segment) occupying two-fifths of its entire length, with a large fovea at base above, the third segment above one-third the length of the second, the fourth, fifth and sixth very short and gradually shortening, the seventh and eighth much longer.

Bred May, 1895, from infested stalks of wheat collected March 27.

Subapterous form.

♂. Length 1.4 mm. Bronze green, the head in front blue-green; scape and pedicel brownish-yellow, the flagellum filiform, dark brown or brown-black, clothed with a fine pale pubescence; palpi pale; mandibles 4-dentate, ferruginous; legs, except coxae, stramineous; coxae metallic; abdomen aeneous black, brassy towards base.

Head and thorax squameously punctate, the head transverse wider than the thorax, about $3\frac{1}{2}$ times as wide as thick antero-posteriorly, the occiput concave; eyes subovate; antennæ 13-jointed, with 2 ring-joints, inserted near the middle of the face, the scape about half as long as the flagellum, the ped-

icel obconical, a little longer than the ring-joints and the first joint of funicle united, the funicle joints all a little longer than thick, the club ovate, 3-jointed.

Thorax with the parapsidal furrows indicated only anteriorly, the pronotum short, rounded anteriorly; scutellum subconvex, with a subobsolete cross-furrow before apex; metathorax with a subglobose neck, without carinae or spiracular sulci, the spiracles very small. Wings abbreviated, narrowed, not reaching much beyond the middle of the abdomen, the tegulae yellowish. Abdomen broadly oval, polished, impunctate, depressed, wider than thorax and usually but not always truncate at apex, by the retraction of the terminal segments; second segment occupying about half the whole surface or nearly so, the following segments short and gradually shortening toward tip.

Hab. — Poitou and various parts of the Vendée in France.

This has also been bred by Dr. Marchal, from his *Cecidomyia* (*Oligotrophus*) *avenae*, infesting oats.

The species comes nearest to *Bocotomus* (*Merisus*) *subapterus* Riley, but is readily distinguished from it by the metallic coxae, darker flagellum, the longer funicular joints and by its broader more depressed abdomen.

It seems quite distinct from *Merisus microptera* Lind., Bull. Soc. Imp. Nat. Moscow, 1887, p. 182.

(4) *Holcaeus cecidomyiae* n. sp.

♀. — Length 2.5 mm. Head and thorax olive-green, squameously punctate; scape, trochanters, knees, tibiae and tarsi, except last joint honey-yellow; pedicel bluish; flagellum black, clothed with a short, blackish pubescence; wings hyaline; abdomen aeneous, the large second segment, except the apical margin, blue.

Head transverse, wider than the thorax, concave behind, about three times as wide as thick antero-posteriorly, the space between the eyes about twice as wide as the eye or a little more than twice the width of the eye; viewed from in front subtriangular; ocelli reddish, subtriangularly arranged. Antennae inserted on the middle of the face, 13-jointed, with 2 ring-joints, the scape extending to middle ocellus or half as long as the flagellum without the pedicel, the latter obconical, smooth, shorter than the first flagellar joint; flagellum subclavate or gradually incrassated towards tip, clothed with a short rather dense pubescence, the joints delicately fluted, the first joint the longest, less than twice as long as thick, the second a little shorter, the following gradually and imperceptibly shortening so that the last joint is scarcely as long as wide.

Thorax a little more than three times as long as wide at the widest part of the pronotum, rounded anteriorly and with its upper surface narrowed at the middle, the mesonotum as long as wide posteriorly, slightly narrowed anteriorly, with the parapsidal furrows only indicated anteriorly; axillae as wide from each other as their width at base, the scutellum proper convex, longer than wide; metathorax not short, with a distinct median carina, the lateral folds wanting, or at least only indicated by foveae at base, the spiracles not large, rounded, with rather broad sulci behind. Front wings with the nervures pale, the marginal nervure one and a half times as long as the stigmal, or a little longer, the stigmal two-thirds as long as the postmarginal, subclavate, the postmarginal a little shorter than the marginal. Abdomen conic-ovate, as long as the thorax, the second segment the longest, as long as segments 3-5 united, with a large fovea at base above where it unites with the short petiole, and with its posterior margin squarely truncate, segments 3-6, subequal, the 7th longer than the foregoing, the 8th conic.

♂. Coeruleous; tibiae except at both ends

embrowned, the scape yellowish beneath, the flagellum long, filiform, with black pile, all the joints long, cylindrical, the first the longest, as long as the scape, or about 7 times as long as thick, the following very gradually shortening; abdomen oblong, nearly linear, with a large oblong, yellow spot on basal third above; otherwise as in female.

This species was bred by Dr. Marchal, in June, 1895, from *Cecidomyia destructor* Say attacking stems of wheat.

The species comes evidently nearest to *H. torymoides* Thomson, but is readily separated in the ♀ by color, the shorter abdomen, relative length of the segments and by the length of the flagellar joints, while the ♂ is at once distinguished by the very long joints of the flagellum which are clothed with black pile, not white pile as in *H. torymoides*.

(5) *Eupelmus atropurpureus* Dalm. ♂ ♀.

(6) *Polygnotus (Platygaster) zosine* Walk. ♂.

With the above parasites I found also a single male specimen of *Isosoma brevicorne* Walk.

Dr. Marchal also reports *Oscinis pusillus* as occurring in the oat stubble.

Host. 2. *Cecidomyia avenae* Marchal.

(1) *Boetomus coxalis* Ashm. ♂.

(2) *Merisus destructor* Say ♂ ♀.

(3) *Homoporus luniger* Nees ♂ ♀.

(4) *Eupelmus atropurpureus* Dalm.
(= *atrocoeruleus* Thoms.) ♂ ♀.

(5) *Eupelmus degeeri* Dalm. ♀.